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			ART UNIT	PAPER NUMBER
			2631	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,456

Applicant(s)

REZNIK ET AL.

Examiner

Juan A. Torres

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 7-11, 16 and 21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-11, 16 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Buzzi ("Blind Adaptive Multiuser Detection for Asynchronous Dual-Rate DS/CDMA Systems" IEEE journal on Selected Areas in Communications Vol. 19 No. 2 pp. 233-244 February 2001) in view of Saito (US 6615030 B1).

Note that the limitation "only" was added to all the independent claims but claim 11.

As per claim 11 Buzzi discloses a receiver comprising an antenna for receiving a plurality of communication signals of differing power levels, the plurality of communication signals including a high power level group of data signals and a low power level group of voice signals (figure 6 page 241); a high data rate data detection device for detecting data of the high power level group of data signals (figure 5 page 240); an interference canceling device for receiving the detected data of the high power level group of data signals and canceling a contribution of the high power level group detected data from the plurality of communication signals, as an interference canceled signal (page 234 equation 3, figure 5 page 240); and a low data rate data detection device for detecting data

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of the low power level group of voice signals from the interference canceled signal (page 234 equation 3, figure 5 page 240); where the high data rate data detection device comprises a blind minimum means square error data detection device (page 236 section IV and figure 3) and the low data rate data detection device comprises a matched filter (page 235 second paragraph). Buzzi doesn't disclose that the voice signals are lower power than the data signals. It is very well known and Saito discloses that the voice signals are lower power than the data signals (column 10 lines 23-55). Buzzi and Saito are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Buzzi the different power between the voice and data signals disclosed by Saito. The suggestion/motivation for doing so would have been to reduce the cost of the receiver (Saito abstract). Therefore, it would have been obvious to combine Buzzi and Saito to obtain the invention as specified in claim 11.

Claims 1-3, 7-10, 11, 16 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keskitalo (US 6128486), in view of Moshavi (US 20040090906 A1); in view of Karlsson (US Patent Application Publication US 20020057730), and further in view of Saito (US 6615030 B1).

As per claim 1 Keskitalo discloses a system for multiuser detection of a received signal, the received signal including voice signals and data signals, said system comprising a first detector having an input to receive the received signal and an output, said first detector extracting the data signals from the received

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signal and outputting them as soft symbols (figure 6 block 604 and figure 7, column 7 lines 64-66); a hard decision converter having an input connected to said first detector output and an output, said hard decision converter converting soft symbols output by said first detector into hard symbols (figure 7 block 724, column 8 lines 19-22); an interference canceller having a second input connected to said hard decision converter output, and an output, said interference canceller canceling a contribution of the data signals from the received signal (figure 7 block 712 and 714, column 8 lines 23-26); and a second detector having an input connected to said interference canceller output, said second detector extracting individual voice signals, said second detector being a different detector type than said first detector (figure 6 block 606 and figure 8, column 8 lines 33-37).

Keskitalo doesn't disclose that the first detector only extracts the data signals; that the second detector only extracts the voice signals. Moshavi discloses that the first detector only extracts the data signals; that the second detector only extracts the voice signals (figure 4b paragraphs [0073]-[0090]). Keskitalo and Moshavi are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo that the first detector only extracts the data signals and that the second detector only extracts the voice signals as disclosed by Moshavi. The suggestion/motivation for doing so would have been to decode a multirate CDMA signal (Moshavi abstract). Keskitalo and Moshavi don't disclose an interference canceller having first input configured to receive the received signal; that the first detector is a blind

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minimum mean square error detector and the second detector is a matched filter or a RAKE-receiver. Karlsson discloses that the interference canceller having first input configured to receive the received signal (figure 20 block 15000, page 13 paragraph [0199]); that the first detector is a blind minimum mean square error detector (figure 20 block 600, page 13 paragraph [0196]) and the second detector is a matched filter (figure 8 block 816 and 814, page 5 paragraph [0072]) or a RAKE-receiver (figure 18 block 1826, page 5 paragraph [0180]). Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Karlsson the connection of the interference canceller to the second detector as disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the interference cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55). Even though it is very well known in the art, Keskitalo, Moshavi and Karlsson doesn't disclose that the voice signals are lower power than the data signals. It is very well known and Saito discloses that the voice signals are lower power than the data signals (column 10 lines 23-55). Saito and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo the different power between the voice and data signals disclosed by Saito Keskitalo. The suggestion/motivation for doing so would have been to reduce the cost of the

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receiver (Saito abstract). Therefore, it would have been obvious to combine Keskitalo, Karlsson, Moshavi and Saito to obtain the invention as specified in claim 1.

As per claim 2 Keskitalo, Karlsson, Moshavi and Saito disclose claim 1. Keskitalo also discloses a data buffer having an input to receive the received signal and an output coupled to the first input of the interference canceller (figure 6 block 612, column 7 lines 9-16).

As per claim 3 Keskitalo, Karlsson, Moshavi and Saito disclose claim 1. Keskitalo also discloses that the first detector output is connected to a symbol processing device; and the second detector output is connected to a symbol processing device (figure 8 block 812, column 8 line 66 to column 9 line 5).

As per claim 7 Keskitalo discloses a method for multiuser detection of a received signal, the received signal including voice signals and data signals, comprising a detecting the data signals and extracting the data signals from the received signal (figure 6 block 604 column 7 lines 64-66); outputting them as soft symbols (figure 7 blocks 704 and 706, column 7 lines 64-66); a hard decision converter having an input connected to said first detector output and an output, said hard decision converter converting soft symbols output by said first detector into hard symbols (figure 7 block 708 and signal 724, column 8 lines 19-22); canceling having a second input connected to said hard decision converter output, and an output, said interference canceller canceling a contribution of the data signals from the received signal (figure 7 block 712 and 714, column 8 lines 23-26); and detecting individual voice signals, the second detecting step being a

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different detecting type than said first detector (figure 6 block 606 and figure 8, column 8 lines 33-37). Keskitalo doesn't disclose that the first detector only extracts the data signals; that the second detector only extracts the voice signals. Moshavi discloses that the first detector only extracts the data signals; that the second detector only extracts the voice signals (figure 4b paragraphs [0073]-[0090]). Keskitalo and Moshavi are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo that the first detector only extracts the data signals and that the second detector only extracts the voice signals as disclosed by Moshavi. The suggestion/motivation for doing so would have been to decode a multirate CDMA signal (Moshavi abstract). Keskitalo and Moshavi don't disclose storing the received signal. Karlsson discloses storing the received signal (figure 20 block 2004 page 13 paragraphs [0198] and [0199]). Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the storing step disclosed by Karlsson in the receiving method disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55). Even though it is very well known in the art, Keskitalo, Moshavi and Karlsson doesn't disclose that the voice signals are lower power than the data signals. It is very well known and Saito discloses that the voice

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signals are lower power than the data signals (column 10 lines 23-55). Saito and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo the different power between the voice and data signals disclosed by Saito and Keskitalo. The suggestion/motivation for doing so would have been to reduce the cost of the receiver (Saito abstract). Therefore, it would have been obvious to combine Keskitalo, Karlsson, Moshavi and Saito to obtain the invention as specified in claim 7.

As per claim 8 Keskitalo, Karlsson, Moshavi and Saito disclose claim 7. Karlsson also discloses that the first detecting step is a blind square error detector (figure 20 block 600, page 13 paragraph [0196]). Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the storing step disclosed by Karlsson in the receiving method disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55).

As per claim 9 Keskitalo, Karlsson, Moshavi and Saito disclose claim 7. Karlsson also discloses that the second detecting step is a matched filter (figure 8 block 818, page 5 paragraph [0072]). Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it

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would have been obvious to a person of ordinary skill in the art to incorporate in the storing step disclosed by Karlsson in the receiving method disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55).

As per claim 10 Keskitalo, Karlsson, Moshavi and Saito disclose claim 7. Karlsson also discloses that the second detecting step is a rake-receiver (figure 18 block 1826, page 5 paragraph [0180]) Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the storing step disclosed by Karlsson in the receiving method disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55).

As per claim 11 Keskitalo discloses a receiver comprising an antenna for receiving a plurality of communication signals of differing power levels, the plurality of communication signals including a high power level group of signals and a low power level group of signals (figure 6 block 600 column 6 lines 54-63); a high data rate data detection device for detecting data of the high power level group of signals (figure 6 block 604 and figure 7, column 7 lines 64-66); an interference canceling device for receiving the detected data of the high power

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level group of signals and canceling a contribution of the high power level group detected data from the plurality of communication signals, as an interference canceled signal (figure 7 block 712 and 714, column 8 lines 23-26); and a low data rate data detection device for detecting data of the low power level group of signals from the interference canceled signal (figure 6 block 606 and figure 8, column 8 lines 33-37). Keskitalo doesn't disclose that the first detector only extracts the data signals; that the second detector only extracts the voice signals. Moshavi discloses that the first detector only extracts the data signals; that the second detector only extracts the voice signals (figure 4b paragraphs [0073]-[0090]). Keskitalo and Moshavi are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo that the first detector only extracts the data signals and that the second detector only extracts the voice signals as disclosed by Moshavi. The suggestion/motivation for doing so would have been to decode a multirate CDMA signal (Moshavi abstract). Keskitalo and Moshavi don't disclose that the first detector is a blind minimum mean square error detector and the second detector is a matched filter or a RAKE-receiver. Karlsson discloses that the interference canceller having first input configured to receive the received signal (figure 20 block 15000, page 13 paragraph [0199]); that the first detector is a blind minimum mean square error detector (figure 20 block 600, page 13 paragraph [0196]) and the second detector is a matched filter (figure 8 block 816 and 814, page 5 paragraph [0072]) or a RAKE-receiver (figure 18 block 1826, page 5

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paragraph [0180]). Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Karlsson the connection of the interference canceller to the second detector as disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the interference cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55). Even though it is very well known in the art, Keskitalo, Moshavi and Karlsson doesn't disclose that the voice signals are lower power than the data signals. It is very well known and Saito discloses that the voice signals are lower power than the data signals (column 10 lines 23-55). Saito and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo the different power between the voice and data signals disclosed by Saito Keskitalo. The suggestion/motivation for doing so would have been to reduce the cost of the receiver (Saito abstract). Therefore, it would have been obvious to combine Keskitalo, Karlsson, Moshavi and Saito to obtain the invention as specified in claim 11.

As per claim 16 Keskitalo discloses means for receiving a plurality of communication signals of differing power levels, the plurality of communication signals including a high power level group of signals and a low power level group of signals (figure 6 block 600 column 6 lines 54-63); means for detecting data of

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the high power level group of signals (figure 6 block 604 and figure 7, column 7 lines 64-66); means for receiving the detected data of the high power level group of signals and canceling a contribution of the high power level group detected data from the plurality of communication signals, as an interference canceled signal (figure 7 block 712 and 714, column 8 lines 23-26); and means for detecting data of the low power level group of signals from the interference canceled signal (figure 6 block 606 and figure 8, column 8 lines 33-37). Keskitalo doesn't disclose that the first detector only extracts the data signals; that the second detector only extracts the voice signals. Moshavi discloses that the first detector only extracts the data signals; that the second detector only extracts the voice signals (figure 4b paragraphs [0073]-[0090]). Keskitalo and Moshavi are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo that the first detector only extracts the data signals and that the second detector only extracts the voice signals as disclosed by Moshavi. The suggestion/motivation for doing so would have been to decode a multirate CDMA signal (Moshavi abstract). Keskitalo and Moshavi don't disclose that the first detector is a blind minimum mean square error detector and the second detector is a matched filter or a RAKE-receiver. Karlsson discloses that the interference canceller having first input configured to receive the received signal (figure 20 block 15000, page 13 paragraph [0199]); that the first detector is a blind minimum mean square error detector (figure 20 block 600, page 13 paragraph [0196]) and the second detector is a matched filter

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(figure 8 block 816 and 814, page 5 paragraph [0072]) or a RAKE-receiver (figure 18 block 1826, page 5 paragraph [0180]). Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Karlsson the connection of the interference canceller to the second detector as disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the interference cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55). Even though it is very well known in the art, Keskitalo, Moshavi and Karlsson doesn't disclose that the voice signals are lower power than the data signals. It is very well known and Saito discloses that the voice signals are lower power than the data signals (column 10 lines 23-55). Saito and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo the different power between the voice and data signals disclosed by Saito Keskitalo. The suggestion/motivation for doing so would have been to reduce the cost of the receiver (Saito abstract). Therefore, it would have been obvious to combine Keskitalo, Karlsson, Moshavi and Saito to obtain the invention as specified in claim 16.

As per claim 21 Keskitalo discloses an input for receiving a plurality of communication signals of differing power levels, the plurality of communication signals including a high power level group of signals and a low power level group

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of signals (figure 6 block 600 column 6 lines 54-63); a first data detection device for detecting data of the high power level group of signals (figure 6 block 604 and figure 7, column 7 lines 64-66); an interference canceling device for receiving the detected data of the high power level group of signals and canceling a contribution of the high power level group detected data from the plurality of communication signals, as an interference canceled signal (figure 7 block 712 and 714, column 8 lines 23-26); and a second data detection device for detecting data of the low power level group of signals from the interference canceled signal (figure 6 block 606 and figure 8, column 8 lines 33-37). Keskitalo doesn't disclose that the first detector only extracts the data signals; that the second detector only extracts the voice signals. Moshavi discloses that the first detector only extracts the data signals; that the second detector only extracts the voice signals (figure 4b paragraphs [0073]-[0090]). Keskitalo and Moshavi are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo that the first detector only extracts the data signals and that the second detector only extracts the voice signals as disclosed by Moshavi. The suggestion/motivation for doing so would have been to decode a multirate CDMA signal (Moshavi abstract). Keskitalo and Moshavi don't disclose that the first detector is a blind minimum mean square error detector and the second detector is a matched filter or a RAKE-receiver. Karlsson discloses that the interference canceller having first input configured to receive the received signal (figure 20 block 15000, page 13 paragraph [0199]); that the first

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detector is a blind minimum mean square error detector (figure 20 block 600, page 13 paragraph [0196]) and the second detector is a matched filter (figure 8 block 816 and 814, page 5 paragraph [0072]) or a RAKE-receiver (figure 18 block 1826, page 5 paragraph [0180]). Karlsson and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Karlsson the connection of the interference canceller to the second detector as disclosed by Keskitalo. The suggestion/motivation for doing so would have been to simplify the baseband processing in the interference cancellation and in multi-user detection and thus to improve the capacity or sensitivity of the detector (Keskitalo column 2 lines 53-55). Even though it is very well known in the art, Keskitalo, Moshavi and Karlsson doesn't disclose that the voice signals are lower power than the data signals. It is very well known and Saito discloses that the voice signals are lower power than the data signals (column 10 lines 23-55). Saito and Keskitalo are analogous art because they are from the same field of endeavor. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate in the receiver disclosed by Keskitalo the different power between the voice and data signals disclosed by Saito Keskitalo. The suggestion/motivation for doing so would have been to reduce the cost of the receiver (Saito abstract). Therefore, it would have been obvious to combine Keskitalo, Karlsson, Moshavi and Saito to obtain the invention as specified in claim 21.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Juan Alberto Torres
08-20-2005


KEVIN BURD
PRIMARY EXAMINER